## Space Weather Forecast

Issued on Friday, 04 February 2022 at 13:29 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Chance of Moderate flares throughout. Chance of isolated G1/Minor Storm activity on days 1 and 2 (04 and 05 February).**

**Analysis of Space Weather Activity over past 24 hours**
**Solar Activity:** Solar activity was low with several Common-class flares, mainly emanating from a large region close to the northwest limb. Two further regions in the northeast quadrant have the potential to produce significant flares, but only occasional Common-class flares have been observed from these regions. A further large region in the southeast quadrant appears to be stable with very limited activity. There are also two very small and benign regions, one in the northwest quadrant and one in the southeast. No Earth-directed CMEs (coronal mass ejections), have been observed on available imagery.

**Solar Wind / Geomagnetic Activity:** The solar wind, has been elevated through the last 24 hours, due to the influence of a magnetic cloud as a result of the CME which arrived on 01 February. This cloud is a bubble of magnetised matter elongated behind the CME and has resulted in periods of moderate magnetic field strength. The north-south component of the magnetic field has been weakly negative throughout, with a current ongoing period of moderate southward orientated magnetic field. Geomagnetic activity has been predominantly Active, with some isolated Unsettled intervals.

**Energetic Particles / Solar Radiation:** The count of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

**Four-Day Space Weather Forecast Summary**
**Solar Activity:** Solar activity is expected to be mainly low, with a chance of moderate class flares and a very slight chance of strong flares.

**Solar Wind / Geomagnetic Activity:** Solar wind speeds are expected to decline through 04 and into 05 February as the effects of the CME are forecast to decline. Two fast winds are then expected to connect with the Earth on 05 and 06 February, both expected to reach 500km/s. Unsettled to Active intervals with a chance of G1/Minor Storms are forecast on 04 February. There is a further chance of G1/Minor Storms on 05 February due to the first fast wind connection, and then a slight chance of G!/Minor Storms on 06 February due to the subsequent fast wind, with background activity of Unsettled with a chance of Active intervals. Activity is then expected to return to Quiet to Unsettled conditions on 07 February.

**Energetic Particles / Solar Radiation:** The count of energetic particles (high energy protons) is forecast to remain at background levels whilst the current sunspots remain quiet and stable, with no radiation storms currently expected.

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Met Office

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | Yes | 30 | 40 | 20 | 5 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 30 | 30 | 30 | 30 |
| Very Active | R3 to R5 X | No | 5 | 5 | 5 | 5 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 5 | 5 | 5 | 5 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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